16

Claims

1.   Method for power saving in a mobile terminal comprising a NIC, wireless
Network Interface Card, used in a wireless LAN, WLAN or the like having one ac-
5   cess point AP, said card either externally plugged in or built in or integrated in the
mobile terminal, wherein the WLAN uses HIPERLAN Type 2 or IEEE 802.11
power save procedures and in which the mobile terminal uses an operating system
supporting device power states, e.g. the OnNow device power states (D0-D3), in
which method:

10   the mobile terminal requests (I) a transition from an active state D0 to a less active
state D3 (or D2 or D1),

upon which request the NIC requests the access point AP to be entered into WLAN
sleep state,

on acknowledgement from the access point the mobile terminal enters WLAN sleep
15   state.

2.   Method according to claim 1 modified in that said request (I), is replaced by an
order.

20   3.   Method for power saving in a mobile terminal comprising a NIC, wireless
Network Interface Card, used in a wireless LAN, WLAN or the like in an ad hoc
network, said card either externally plugged in or built in or integrated in the mobile
terminal, wherein the WLAN uses HIPERLAN Type 2 or IEEE 802.11 power save
procedures and in which the mobile terminal uses an operating system supporting
25   device power states, e.g. the OnNow device power states (D0-D3), in which
method:

the mobile terminal requests (II) a transition from an active state D0 to a less active
state D3 (or D2 or D1),

upon which request the NIC requests a further mobile terminal in the ad hoc net-
30   work, i.e. the mobile terminal to be entered into WLAN sleep state,

on acknowledgement from the further mobile terminal the mobile terminal enters
WLAN sleep state

4. Method according to claim 3 modified in that said request, (II), is replaced by
an order.

5. Method for power saving in a mobile terminal comprising a NIC, wireless
Network Interface Card, used in a wireless LAN, WLAN or the like having one ac-
cess point AP, said card either externally plugged in or built in or integrated in the
mobile terminal, wherein the WLAN uses HIPERLAN Type 2 or IEEE 802.11
power save procedures and in which the mobile terminal uses an operating system
supporting device power states, e.g. the OnNow device power states (D0-D3), in
which method:
the mobile terminal due to inactivity requests (IV) a transition from an active state
D0 to a less active state D3 (or D2 or D1)
upon which request the NIC and/or mobile terminal requests the access point AP to
be disassociated and/or de-authenticated from the access point,
on acknowledgement from the access point AP, the mobile terminal enters a disas-
sociated and/or de-authenticated state.

6. Method according to claim 5 modified in that said request, (IV), is replaced by
an order.

7. Method according to claim 1 in which the mobile termi-
nal/NIC is disassociated and/or de-authenticated from the AP without using a disas-
sociation and/or de-authentication signal.

8. Method for power saving in a mobile terminal comprising a NIC, wireless
Network Interface Card, used in a wireless LAN, WLAN or the like in an ad hoc
network, said card either externally plugged in or built in or integrated in the mobile

terminal, wherein the WLAN uses HIPERLAN Type 2 or IEEE 802.11 power save procedures and in which the mobile terminal uses an operating system supporting device power states, e.g. the OnNow device power states (D0-D3), in which method:

5   the mobile terminal due to inactivity requests (II) a transition from an active state D0 to a less active state D3 (or D2 or D1)

upon which request the NIC and/or mobile terminal requests a further mobile terminal in the ad hoc network to be disassociated and/or de-authenticated from the ad hoc network,

10   on acknowledgement from the further mobile terminal, the mobile terminal enters a disassociated and/or de-authenticated state.

9.   Method according to claim 8 modified in that said request, (II), is replaced by an order.

15

10.   Method according to claim 3 in which the mobile terminal/NIC is disassociated and/or de-authenticated from the ad hoc network without using a disassociation and/or de-authentication signal.

20   11.   Method according to claim 1 in which the mobile terminal/NIC associates and/or authenticates to the access point AP on transition from a less active state D3 (or D2 or D1) to D0.

12.   Method according to claim 3 in which the mobile terminal/NIC joins an ad hoc network by associating and/or authenticating to the ad hoc network on transition from a less active state D3 (or D2 or D1) to D0.

13.   Method for power saving in a mobile terminal comprising a NIC, wireless Network Interface Card, used in a wireless LAN, WLAN or the like having one access point AP, said card either externally plugged in or built in or integrated in the

mobile terminal, wherein the WLAN uses HIPERLAN Type 2 or IEEE 802.11 power save procedures and in which the mobile terminal uses an operating system supporting device power states, e.g. the OnNow device power states (D0-D3), in which method:

5   the mobile terminal forces the NIC down to D3 cold or D3 initialise at a point of time later than a time-out interval due to inactivity in order to lower the system state.

14. Method for power saving according to claim 13, in which the method also comprises the step of the mobile terminal forcing the NIC from D3cold or D3 ini-

10   tialise to a higher power state, when activity is detected or when data is pending for transmission.

15. Method according to claim 13 in which a timer in the mobile terminal is used to initiate the mobile terminal to power down the NIC.

15   16. Method according to claim 1 in which the NIC enters its lowest power consumption mode.

17. Method for power control in a mobile terminal comprising a NIC, wireless

20   Network Interface Card, used in a wireless LAN, WLAN or the like having one access point AP, said card either externally plugged in or built in or integrated in the mobile terminal/PC, wherein the WLAN uses HIPERLAN Type 2 or IEEE 802.11 power save procedures and in which the mobile terminal uses an operating system supporting device power states, e.g. the OnNow device power states (D0-D3), in

25   which method:

- the mobile terminal being in a low power mode, e.g. D3, D2, or D1, requests transition to active state D0,

- upon which request the NIC requests the access point to be entered into WLAN active state, and

in which the mobile terminal enters the WLAN active state on acknowledgement from the access point.

18.   Method for power control in a mobile terminal comprising a NIC, wireless Network Interface Card, said card either externally plugged in or built in or integrated in the mobile terminal, and used in a wireless LAN, WLAN or the like in an ad hoc network, said network comprising at least one further mobile terminal, wherein the WLAN uses HIPERLAN Type 2 or IEEE 802.11 power save procedures and in which the mobile terminal uses an operating system supporting device power states, e.g. the OnNow device power states (D0-D3), in which method:
- the mobile terminal being in a low power mode, e.g. D3, D2, or D1, requests transition to active state D0,
- upon which request the NIC requests the further mobile terminal to be entered into WLAN active state, and
in which the mobile terminal enters the WLAN active state on acknowledgement from the further terminal.

19.   Method according to claim 5   in which the mobile terminal/NIC is disassociated and/or de-authenticated from the AP without using a disassociation and/or de-authentication signal.

20.   Method according to claim 8   in which the mobile terminal/NIC is disassociated and/or de-authenticated from the ad hoc network without using a disassociation and/or de-authentication signal.

21.·   Method according to claim 5   in which the mobile terminal/NIC associates and/or authenticates to the access point AP on transition from a less active state D3 (or D2 or D1) to D0.

22.   Method according to claim 8 in which the mobile termi-
nal/NIC joins an ad hoc network by associating and/or authenticating to the ad hoc
network on transition from a less active state D3 (or D2 or D1) to D0.

23.   Method according to claim 3 in which the NIC enters its lowest power consumption mode.

24.   Method according to claim 5 in which the NIC enters its lowest power consumption mode.

25.   Method according to claim 8 in which the NIC enters its lowest power consumption mode.